

**CLAIMS**

I claim:

*Sub B1* 5

1. A foundry binder composition comprising as a mixture:

- (a) an organic foundry binder having at least one component; and
- (b) an effective amount of a divalent sulfur compound where said divalent sulfur compound is present in at least one component of the binder.

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2. The foundry binder composition of claim 2 wherein the divalent sulfur compound is a thiuram.

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3. The foundry binder composition of claim 2 wherein the organic binder is selected from the group consisting of phenolic-urethane binders, phenolic shell binders, aqueous alkaline phenolic resole binders, acrylic/epoxy binders, and furan binders.

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3. The foundry binder composition of claim 3 wherein the organic binder is a cold-box binder.

4. The foundry binder composition of claim 4 wherein in the cold-box binder is a phenolic urethane binder.

25 6. The foundry binder composition of claim 5 wherein the divalent sulfur compound is dispersed in a medium before adding said divalent sulfur compound to the organic binder, and the divalent metal compound is selected from the group consisting of tetrabutyl thiuram disulfide, tetraethyl thiuram disulfide, tetramethyl thiuram disulfide, tertbutyl thiuram disulfide and mixtures thereof.

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7. A foundry mix comprising:

- (a) a major amount of a foundry aggregate;
- (b) an effective binding amount of an organic foundry binder having at least one component; and
- (c) an effective amount of a divalent sulfur compound that is present in (a), at least one component of (b), or both.

8. The foundry mix of claim 7 wherein the divalent sulfur compound is a thiuram.

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9. The foundry mix of claim 8 wherein the organic binder of the foundry mix is selected from the group consisting of phenolic-urethane binders, phenolic shell binders, aqueous alkaline phenolic resole binders, acrylic epoxy binders, and furan binders.

10. The foundry mix of claim 9 where the organic binder is a cold-box binder.

11. The foundry mix of claim 10 wherein the cold-box binder is a phenolic urethane binder.

12. The foundry mix of claim 11 wherein the divalent sulfur compound is dispersed in a liquid dispersant before mixing said divalent sulfur compound with (a) or (b), and the divalent metal compound is selected from the group consisting of tetrabutyl thiuram disulfide, tetraethyl thiuram disulfide, tetramethyl thiuram disulfide, tertbutyl thiuram disulfide and mixtures thereof.

13. A cold-box process for preparing foundry shapes which comprises:

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cont'

(A) introducing a foundry mix of claim 7, 8, 9, 10, 11, or 12 into a pattern to prepare an uncured foundry shape;

5 (B) contacting said uncured foundry shape prepared by (A) with a vaporous curing catalyst;

(C) allowing said foundry shape resulting from (B) to cure until said shape becomes handleable; and

10 (D) removing said foundry shape from the pattern.

~~12~~ 14. The process of claim ~~13~~ wherein the foundry shape is an internal core.

~~13~~ ~~15~~ 15. The process of claim ~~14~~ wherein the binder is a phenolic urethane binder.

~~14~~ ~~16~~ 16. A foundry shape prepared in accordance with claims ~~15~~ ~~13~~.

~~15~~ ~~17~~ 17. A process for casting a metal part which comprises:

20 (A) inserting a foundry shape of claim ~~16~~ ~~14~~ into a casting assembly;

(B) pouring metal, while in the liquid state, into said casting assembly;

25 (C) allowing said metal to cool and solidify; and

(D) then separating the cast metal part from the casting assembly.

~~16~~<sub>18</sub> ~~17~~ 18. The process of claim ~~17~~ wherein the metal is aluminum.

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Claim 18*

*16*  
The process of claim 18 wherein the foundry shape is an internal core.

*18/19*

*17*  
A metal part prepared in accordance with claim 19.

5 21. A foundry binder system comprising:

(a) an organic foundry binder having at least one component; and

(b) a divalent sulfur compound,

10 where (a) and (b) are separate components.

15 22. The foundry binder system of claim 21 wherein the divalent sulfur compound is elemental sulfur.

20 23. The foundry binder system of claim 22 wherein the organic binder is selected from the group consisting of phenolic-urethane binders, phenolic shell binders, aqueous alkaline phenolic resole binders, acrylic/epoxy binders, and furan binders.

25 24. The foundry binder system of claim 23 wherein the organic binder is a cold-box binder.

25 25. The foundry binder system of claim 24 wherein in the cold-box binder is a phenolic urethane binder.

26. The foundry binder system of claim 25 wherein the divalent sulfur compound is dispersed in a medium before adding said divalent sulfur compound to the organic binder.